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**TITLE:** Impact of Optimized Land Surface Parameters on the Land-Atmosphere Coupling in WRF Simulations of Dry and Wet Extremes

**PRESENTATION TYPE:** Poster Requested

**CURRENT SECTION/FOCUS GROUP:** Hydrology (H)

**CURRENT SESSION:** H29. Evaporation and Water Transport Dynamics in the ABL

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**ABSTRACT BODY:** Land-atmosphere (L-A) interactions play a critical role in determining the diurnal evolution of both planetary boundary layer (PBL) and land surface temperature and moisture budgets, as well as controlling feedbacks with clouds and precipitation that lead to the persistence of dry and wet regimes. Recent efforts to quantify the strength of L-A coupling in prediction models have produced diagnostics that integrate across both the land and PBL components of the system. In this study, we examine the impact of improved specification of land surface states, anomalies, and fluxes on coupled WRF forecasts during the summers of extreme dry (2006) and wet (2007) conditions in the U.S. Southern Great Plains. The improved land initialization and surface flux parameterizations are obtained through the use of a new optimization and uncertainty module in NASA's Land Information System (LIS-OPT), whereby parameter sets are calibrated in the Noah land surface model and classified according to the land cover and soil type mapping of the observations and the full domain. The impact of the calibrated parameters on the a) spinup of land surface states used as initial conditions, and b) heat and moisture fluxes of the coupled (LIS-WRF) simulations are then assessed in terms of ambient weather, PBL budgets, and precipitation along with L-A coupling diagnostics. In addition, the sensitivity of this approach to the period of calibration (dry, wet, normal) is investigated. Finally, tradeoffs of computational tractability and scientific validity (e.g., relating to the representation of the spatial dependence of parameters) and the feasibility of calibrating to multiple observational datasets are also discussed.

**KEYWORDS:** [1818] HYDROLOGY / Evapotranspiration, [1840] HYDROLOGY / Hydrometeorology, [1846] HYDROLOGY / Model calibration, [1843] HYDROLOGY / Land/atmosphere interactions.

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